Electronic Supplementary Material (ESI) for Analytical Methods.

Supplemental Information

A sensitive colorimetric aptasensor for chloramphenicol detection in fish and pork based on the amplification of nano peroxidase-polymer

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S1.1 Characterization of AuMNPs-Apt

Vibrating sample magnetometry (VSM) was employed to evaluate the magnetic properties of Fe_3O_4 NPs, AuMNPs and AuMNPs-Apt. Fig.S2 shows the magnetic hysteresis loops of the dried samples at room temperature. The saturation magnetization values obtained at room temperature were 74.64, 52.93 and 41.53 emu g^{-1} for Fe_3O_4 NPs, AuMNPs and AuMNPs-Apt, respectively. Moreover, The coercively of AuMNPs-Apt is almost zero, it proved that the magnetic capture probes is super paramagnetic. These data demonstrated the paramagnetic nature of Fe_3O_4@Au and their sensing composite, which allowed for effective magnetic adsorption and allowed for effective magnetic adsorption.

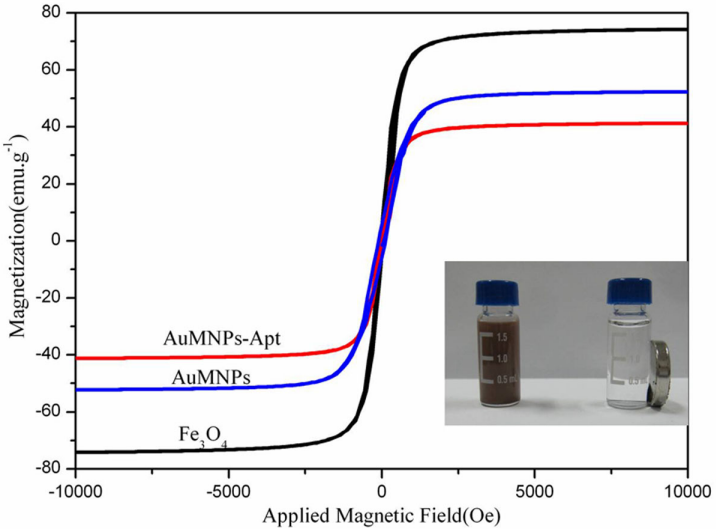

Fig. S1. The hysteresis loops of Fe_3O_4, AuMNPs and AuMNPs-Apt. The insert shows the separation and redispersion process of a solution of AuMNPs-Apt in the absence (left) and presence (right) of an external magnetic field.

S1.2 Optimization of experimental conditions

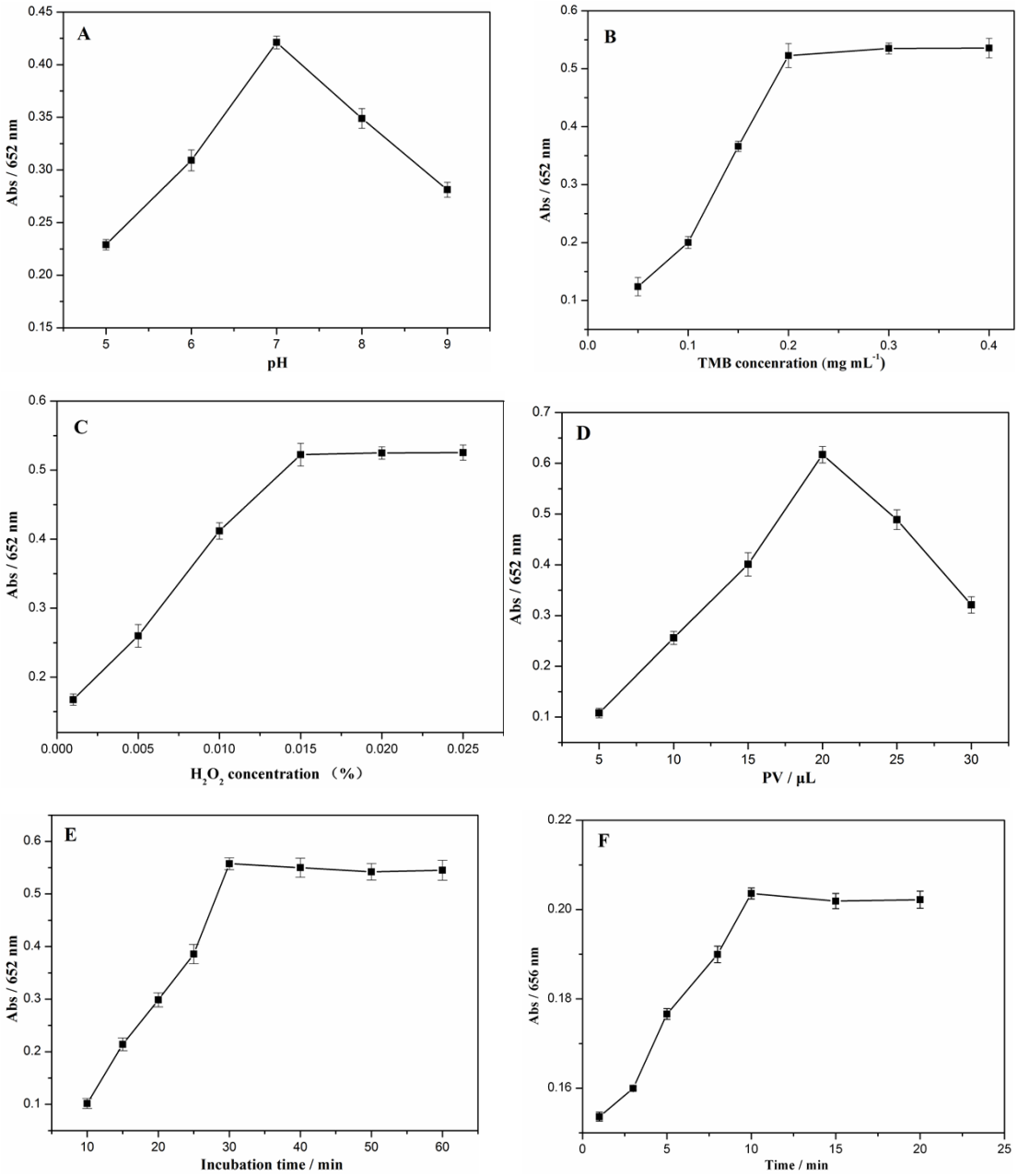

Fig. S2. Dependences of OD value on pH (A), TMB concentration (B), H_2O_2 concentration (C), the volume of PV (D), incubation time (E), response time of the detection for measurement sample (F), when one parameter changed and the others were under their optimal conditions.

S1.3 Adsorption kinetics and isotherm

Under optimal assay conditions (Section 3.5, Fig. S2), the adsorption kinetics and isothermic curves of CAP on the AuMNPs-Apt/cDNA-AuNPs-PV conjugates were presented in Fig. S3. Fig. S3 (A) illustrated the effect of response time from 0 to 60 min on the absorbance response. With the increasing response time, the absorbance intensity increased and achieved a maximum value at 30 min. Therefore, 30 min would be caught before saturate adsorption was achieved (namely response time). As presented in Fig. S3 (B), the absorbance increased as the concentration of CAP increased below 300 ng mL^{-1}, and then reached a plateau at 300 ng mL^{-1}. In addition, by fitting the experimental data with the isothermic adsorption curves, the saturated adsorption capacity of AuMNPs-Apt/cDNA-AuNPs-PV conjugates was approximately 75.0 mg g^{-1}.

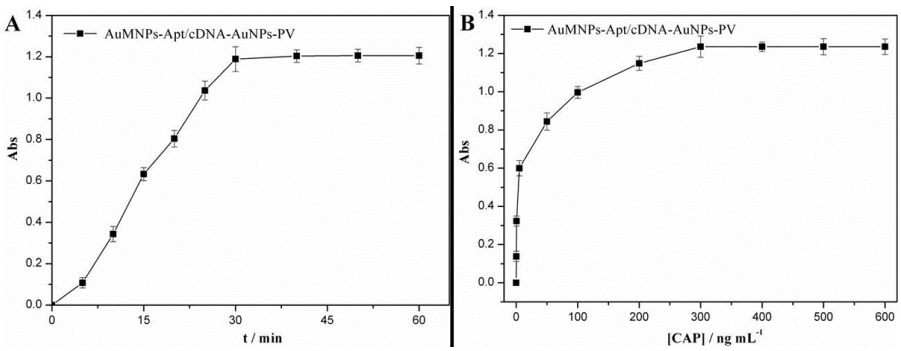

Fig. S3. (A) Adsorption kinetics of CAP on the AuMNPs-Apt/cDNA-AuNPs-PV conjugates, (B) Adsorption isothermic curves of CAP on the AuMNPs-Apt/cDNA-AuNPs-PV conjugates.

Table S1 Comparison of analytical properties of the developed colorimetric aptasensor with other CAP detection methods.

Samples	Assay	pH	Detection method	Linear range (ng mL^{-1})	LODs (ng mL^{-1})	Advantages	Reference
Milk	SPCE/GS-Nf/GMP-BSA-CAP immunosensor	7.0	Amperometric immunosensor	2-200	0.82	Sensitive, low cost disposable	[1]
Milk	MIP-CP voltametric sensor	7.0	Voltametric sensor	2.6-323.1	0.65	Cheap, simple	[2]
Egg, Honey, Milk	HPLC-MS/MS immunoassay	-	HPLC-MS/MS	0.1-100	-	Cheap, effective	[3]
Milk	Electrochemical aptasensor	7.6	SWV	0.52-135.6	0.52	Sensitive, simple	[4]
Milk	GO-based aptasensor	7.0	Fluorescence sensor	0.0325-3.25	0.25	Sensitive	[5]
Milk	Electrochemical aptasensor	7.6	DPV	0.1-0.65	0.06	Stable, sensitive	[6]
-	Electrochemical impedimetric aptasensor	7.6	CV	0.57-41.3	0.57	Cheap, accurate	[7]
Fish, Pork	Colorimetric aptasensor	7.0	UV	0.05-200	0.02	Simple, sensitive, visualization	This work

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